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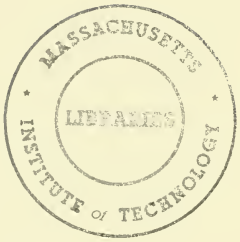
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TOP PRIORITIES FOR THE INFORMATION SYSTEMS FUNCTION

Robert M. Alloway

Judith A. Quillard

September 1981

CISR No. 79
Sloan WP No. 1264-81

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ABSTRACT

The goal of this research has been to determine those areas which management should consider as top priorities for improving the success of the information systems function. In order to achieve this, an integrated definition of I/S success was developed and used to evaluate the I/S function in nineteen industrial firms. Using the results of these assessments, areas that will maximize the improvement in overall I/S success are identified as the top priorities for I/S.

The paper begins with an assessment of the current situation; first, how severe is the problem with I/S success and second, what are the relative strengths and weaknesses of typical I/S departments. A definition of I/S success is developed which includes 26 criteria covering the range of I/S activities. The measurement of success, based on the opinions of both user and I/S managers, includes a rating of the relative importance of each criterion, as well as a rating of its performance. The results indicate that there is in fact a problem in overall I/S success, especially in effectiveness-oriented criteria.

The underlying cause for the low rating of overall success is then explored. In searching for this basic cause, agreement is found between I/S and user managers that is both surprising and encouraging. Not only do they agree in their views of I/S success, but their agreement extends to the components of success as well: the dimensions of importance and performance. Contrary to popular opinion, the cause of low success is not to be found in disagreements between user and I/S managers.

Instead, the cause of mediocre overall success ratings and low success on specific criteria is to be found in the undeniable lack of a relationship between what is important for I/S and what I/S performs well. This lack of a managerially justifiable relationship between importance and performance is seen not only by users but by I/S professionals as well. Apparently, I/S management has not been able to effectively allocate resources so that the relative performance of the 26 success criteria matches their respective relative importances.

The diagnosis of the gap between importance and performance as the cause of low success provides the basis for establishing the top priorities for I/S. To maximize improvement in overall I/S sucess, the I/S department must direct its improvement efforts to those criteria where relative importance is significantly greater than relative performance. These top priority criteria are then classified in order to facilitate integrated planning for both structural and task-oriented improvement efforts.

This process of defining, measuring, and diagnosing I/S success is a practical, effective method for identifying top priorities for I/S strategic planning and resource allocation.

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CONTENTS

Introduction 1
The User Needs Survey Sample

Where are the Problems in I/S Success? 5
Defining I/S Success 5
Measuring I/S Success 8
Overall I/S Success 8
Relative Strengths and Weaknesses in I/S Success 11
Does the Success Pattern Hold for all Firms? 15
Intermediate Summary 17

What is the Underlying Cause of Low Success? 18
Do User and I/S Managers Disagree on Success? 18
Do User and I/S Managers Disagree on Importance? 21
Do User and I/S Managers Disagree on Performance? 23
Intermediate Summary 25

Found: The "Cause" of Low Success 26

Priorities for I/S 31
Importance/Performance Gaps and Priorities 31
Determining Levels of Priority 33
Improvement Efforts for Increased I/S Success 35

Top Priorities: A Mandate for I/S Action 39

Figure 1. Profile of Firms Surveyed 3
Figure 2. Number of respondents 4
Figure 3. Criteria for Defining I/S Success 6
Figure 4. Measuring I/S Success 9
Figure 5. Average Success Ratings by Company 10
Figure 6. Average Success Ratings by Criteria 12
Figure 7. Average company success ratings by criteria -- plus and minus variance 16
Figure 8. Comparison of I/S and User Ratings of Success 19
Figure 9. Comparison of I/S and User Ratings of Importance 22
Figure 10. Comparison of I/S and Users Ratings of Performance 24
Figure 11. Comparison of User Ratings of Importance and Performance 27
Figure 12. Comparison of I/S ratings of Importance and Performance 29
Figure 13. Importance - Performance Gaps of I/S and Users 32
Figure 14. Priorities for Action 34
Figure 15. I/S Improvement Efforts 36

Computer systems have become critical to the daily operation of most large companies. In fact for many corporations, computer-based information systems have become key to competitiveness in the marketplace. In addition to supporting the routine operational functions, computer-based information systems are being used more and more to support the information needs of managers.

In a continually changing technical environment, information systems are also changing the nature of their relationship with the rest of the company. It is thus critical that the information systems (I/S) function be well-managed. The I/S department must allocate its resources, particularly its scarce management and personnel resources, in order to best meet the company's business needs. For I/S planning to be relevant and effectively implemented, senior and middle level user managers must be involved in assessing success, setting priorities, and allocating resources. The company's top priorities for the information systems function must be understood and endorsed by both I/S and user management.

However, any process of setting priorites is frequently undermined by the need for short-term, if not immediate, results. Often priorities are assigned on the basis of the "squeaky wheel" phenomenon or by power politics, not on the basis of the most important underlying needs.

A company should be able to assess the success of its I/S department and to develop priorities for action that will increase overall success. The relative strengths and weaknesses of all I/S activities should be considered. Only by including the breadth of I/S activities can trade-offs be made when setting priorities for I/S management.

To be effective in improving I/S success, management must be able to diagnose success, differentiate areas of relative strengths and weaknesses, and prioritize resource allocation on the basis of the greatest contribution to overall success. This paper presents such a diagnosis, differentiation, and prioritization, based on a survey of a thousand I/S and user managers from nineteen industrial firms.

First, this paper develops a conceptual framework that provides an integrated definition of I/S success across the breadth of I/S activity. Secondly, it diagnoses success and uses the discovered cause of low success as the basis for developing the top priorities for the I/S function. The

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results are encouraging. Not only does there seem to be strong agreement between user managers and I/S managers regarding the current level of I/S success, but there also is good agreement on the top priorities for its improvement.

THE USER NEEDS SURVEY SAMPLE

The thousand managers whose responses are being used to assess I/S success were surveyed as part of a large research project, the User Needs Survey. The project is being conducted at M.I.T.'s Center for Information Systems Research (CISR), with Dr. Robert M. Alloway as Principal Investigator.[1] The purpose of the User Needs Survey is to recommend improved information systems policies and procedures. The study was motivated by the desire to better understand the managers who are end users of computer-based systems and the issues involved in fulfilling their information needs.

Nineteen companies from the industrial sector participated in the project. As summarized in Figure 1, they differed in industrial classification, size (as measured by revenues), and I/S department budget in relation to total revenues. The companies also differed in corporate structure, in the size and structure of their I/S departments, and in the reporting relationship of the I/S department within the company.

In each company, the research team selected managers from the I/S, Finance and Manufacturing departments to complete a comprehensive questionnaire which addressed a range of issues related to the I/S function.

The respondents were chosen to be a representative sample of both the managerial levels and the job functions in each of the three departments. Figure 2 shows that of the 1058 managers surveyed, just over forty percent were I/S professionals and just under sixty percent were users. Level 1 respondents are the heads of their respective departments, and level 4 are first line managers.

The User Needs Survey methodology was carefully designed and well implemented to ensure relevant, high quality data. The survey has provided a foundation for the analysis of the components of I/S success and the development of a set of top priorities for improving I/S success in the future.

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[1] For a description of this project, see Alloway, R.M., C.V. Bullen, and J.A. Quillard, "Overview of the User Needs Survey Research Project", CISR Working Paper #73, M.I.T., June 1981.

FIGURE 1. PROFILE OF FIRMS SURVEYED

INDUSTRY CLASSIFICATION FOR THE 19 FIRMS

- o Paper, fiber and wood products
- o Rubber, plastics products
- o Chemicals
- o Aerospace
- o Communications
- o Food processing
- o Tobacco products
- o Textiles
- o Motor vehicles
- o Office equipment
- o Measuring, analyzing, and control equipment
- o Electronics

SIZE OF FIRMS

Revenue Range	Number of Sample Firms	Firms' Parent Organizations
over $ 10 billion	-	4
$ 5 billion - $ 10 billion	2	3
$ 1 billion - $ 5 billion	6	6
$500 million - $ 1 billion	4	2
$100 million - $500 million	4	2
under $100 million	3	2
	19	19

I/S BUDGET AS A PERCENT OF FIRMS' REVENUES

Percentage Range	Number of Firms
2% - 3%	4
1% - 2%	5
0.5% - 1%	4
0.25% - 0.5%	6

FIGURE 2. NUMBER OF RESPONDENTS

*LEVELS	I/S	MFG	FINANCE	TOTALS
1	26	18	18	62 (5.9%)
2	37	40	35	112 (10.6%)
3	96	115	84	295 (27.9%)
4	289	159	141	589 (55.6%)
TOTALS	448	332	278	1058 (100%)
	(42.3%)	(31.4%)	(26.3%)	

* Level 1 = Department head

Level 4 = First-line manager; average salary: $25,000

In order to determine whether or not there is a problem with I/S success, and where those problems might be located, we need first to define success for the information systems function. Unfortunately, defining success for I/S is akin to hitting a moving target. There has been dramatic growth in demand for new systems applications, with an associated impact on the attitudes and opinions of user and I/S managers alike. [2] This explosion of I/S activity has resulted from the simultaneous interaction of many factors, including continued dramatic improvements in hardware technology, increased dependence of modern corporations on information processing, more corporate resources dedicated to the I/S function, and a growing computer literacy among users.

DEFINING I/S SUCCESS

A definition of I/S success must take into account the changing relationship between users and the I/S function in corporate organizational environments today. It must incorporate the breadth and diversity of factors, such as operations, maintenance, systems development, long range planning, and user interface, which constitute the scope of I/S responsibility in such settings.

Figure 3 provides the set of criteria developed for the User Needs Survey which can be used as a basis for defining I/S success. It is, in some respects, an arbitrary list of criteria which we believe to be relevant to all I/S departments. The set of criteria is not intended to be exhaustive. Instead it is designed to be a high level aggregation of activities representing the breadth and diversity of I/S functions.

In particular, the User Needs Survey success criteria represent the three different categories of planning and control activities which must take place in a growing, adaptive organization. These planning and control activities have been identified by Robert Anthony as strategic, tactical and operational.[3] Each of these categories is represented by many

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[2] Alloway, R.M., "User Managers Systems Needs", CISR Working Paper #56, M.I.T., May 1980. This paper differentiates the demand for information systems among several types and also discusses the level of demand for each system type.

[3] Anthony, R.N., Planning and Control Systems: A Framework for Analysis, Harvard University Graduate School of Business Administration, Boston, 1965.

FIGURE 3. CRITERIA FOR DEFINING I/S SUCCESS

A. COMMUNICATION WITH MANAGERIAL USERS

B. EFFICIENCY OF HARDWARE UTILIZATION

C. HARDWARE AND SYSTEMS DOWNTIME

D. TRAINING PROGRAMS FOR USERS IN GENERAL I/S CAPABILITIES

E. DATA SECURITY AND PRIVACY

F. QUALITY OF I/S SYSTEMS ANALYSTS

G. THE ATTITUDE OF I/S PERSONNEL TOWARD USERS

H. TECHNICAL COMPETENCE OF THE I/S STAFF

I. THE NEW SYSTEM REQUEST BACKLOG

J. DEVELOPING MORE MONITOR SYSTEMS

K. DEVELOPING MORE EXCEPTION SYSTEMS

L. DEVELOPING MORE INQUIRY SYSTEMS

M. DEVELOPING MORE ANALYSIS SYSTEMS

N. INVOLVEMENT OF SENIOR USER MANAGERS IN I/S POLICY FORMULATION AND EVALUATION

O. RESPONSIVENESS TO USER NEEDS

P. I/S STRATEGIC PLANNING AND ALLOCATION OF RESOURCES TO KEY BUSINESS AREAS

Q. INCREASING THE PROPORTION OF I/S EFFORT EXPENDED IN CREATING NEW SYSTEMS

R. TECHNICAL SOPHISTICATION OF NEW SYSTEMS

S. IMPROVING NEW SYSTEMS DEVELOPMENT (TIME, COST, QUALITY, DISRUPTIONS)

T. USER ORIENTED SYSTEMS ANALYSTS WHO KNOW USER OPERATIONS

U. I/S SUPPORT FOR USERS IN PREPARING PROPOSALS FOR NEW SYSTEMS

V. APPROPRIATE I/S BUDGET SIZE OR GROWTH RATE

W. AVAILABILITY AND TIMELINESS OF REPORT DELIVERY TO USERS

X. RUNNING CURRENT SYSTEMS (COSTS, EASE OF USE, DOCUMENTATION, MAINTENANCE)

Y. REPORT CONTENTS (RELEVANCE, CURRENTNESS, FLEXIBILITY, ACCURACY)

Z. I/S PROFITABILITY (FROM CHARGEOUTS FOR SERVICES)

criteria in the User Needs Survey definition of success, as the following examples show:

Strategic activities

- N. Involvement of senior user managers in I/S policy formulation and evaluation
- O. Responsiveness to user needs
- P. I/S strategic planning and allocation of resources to key business areas

Tactical activities

- H. Technical competence of the I/S staff
- S. Improving new systems development
- U. I/S support for users in preparing proposals for new systems

Operational activities

- B. Efficiency of hardware utilization
- C. Hardware and systems downtime
- W. Availability and timeliness of report delivery to users

In addition, the list of criteria can be related to a variety of technical, operational, organizational, personnel, and planning concerns.

Beyond this balance by activity and topic, the 26 success criteria effectively represent the interests and needs of users as well as I/S professionals. The set of criteria is not exclusively concerned with traditional technical "DP" requirements. Instead, it is explicitly directed towards user concerns as well, for example, training programs for users (D), user-oriented systems analysts (T), and communication with managerial users (A).

The set of 26 criteria therefore provides us with a broad view of success for the I/S function in its current dynamic environment. It provides us with a balanced and easily understood basis for assessing the I/S function in organizations like the nineteen firms studied in the User Needs Survey. As an integrated definition of success, it enables not only an overall measurement but also an assessment of relative success for each criterion. But we still need a method which allows us to actually assess -- or measure -- I/S success in the context of a particular firm or organization.

Interviews with user managers have consistently highlighted the need to account for two different dimensions when actually assessing the success of the I/S function in a particular organization. The first is the relative importance of a particular activity (or, in this case, a particular success criterion). The second is the actual performance on that activity or criterion. Measuring overall I/S success, therefore, really requires that we assess the relative importance of each of our 26 success criteria as well as I/S's actual performance on these same criteria.

This distinction between importance and performance suggests that to be rated as highly successful, an I/S criterion must not only have good performance, but must also be acknowledged by I/S and user managers to be a relatively important one as well. Obviously, low performance on a very important I/S criterion should not be considered as very successful. Conversely, a high performance rating for a criterion of relatively low importance can not be considered to be highly successful either.

Measuring I/S success, therefore, is not simply a task of measuring performance. It requires that we develop a measure of performance that is affected (or weighted) by a similar measure of relative importance. In order to allow for ratings on both dimensions, the User Needs Survey established rating scales which allowed I/S and user managers to rate both the performance and the importance of all 26 I/S success criteria. These scales, both of which have a range extending from a low rating of "1" to a high rating of "7", are illustrated in Figure 4.

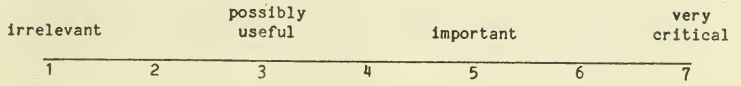
Using this methodology to measure I/S success, the User Needs Survey asked a thousand user and I/S managers in nineteen different firms to rate the performance and the relative importance of all 26 success criteria. These two ratings were then combined through the weighting algorithm shown in Figure 4 to arrive at an overall success rating. When aggregated across all criteria, we were able to develop an overall success rating for the I/S department in each firm. In addition, we were able to develop success ratings for each of the 26 criteria for the entire sample of a thousand managers.

OVERALL I/S SUCCESS

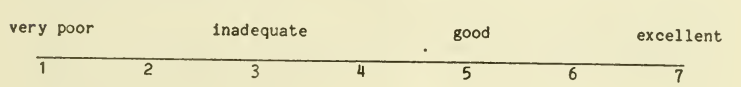
What did the success ratings of user and I/S managers indicate about the success of the I/S function in the nineteen firms? The combined success ratings suggest that there is, indeed, a problem with I/S success. The bottom of Figure 5 shows that the overall success rating for all nineteen firms is only 4.28,

FIGURE 4. MEASURING I/S SUCCESS

IMPORTANCE RATING SCALE



PERFORMANCE RATING SCALE



COMBINING IMPORTANCE AND PERFORMANCE FOR COMPUTING SUCCESS

$$\text{For Each Manager} \quad \sum_{C=1}^{26} \frac{\text{Importance}_C \times \text{Performance}_C}{\sum_{C=1}^{26} \text{Importance}_C} = \text{SUCCESS}_M$$

where C=1,...,26 are the Criteria A thru Z.

SUCCESS RATING SCALE

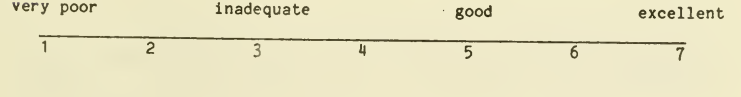


FIGURE 5. AVERAGE SUCCESS RATINGS BY COMPANY

COMPANY	I/S MANAGERS	USER MANAGERS	ALL MANAGERS
1	5.00	4.36	4.71
2	4.30	3.87	3.98
3	4.01	3.38	3.67
4	4.11	4.34	4.29
5	4.39	4.76	4.64
6	4.53	3.65	3.86
7	4.32	3.98	4.20
8	4.97	4.75	4.85
9	4.19	4.01	4.07
10	4.03	4.10	4.07
11	4.59	3.87	4.09
12	4.80	4.47	4.62
13	4.39	4.25	4.31
14	4.22	4.63	4.41
15	4.26	4.36	4.32
16	4.47	3.87	4.16
17	4.41	4.18	4.26
18	4.74	4.86	4.80
19	4.40	3.93	4.09
AVERAGE	4.43	4.19	4.28

approximately midway between "Inadequate" and "Good" on the scale.

It is not surprising that average overall success for nineteen firms is in the middle range of the scale. Ratings at the two extremes of the scale are both unlikely possibilities for any extended period of time. Ratings at the "Inadequate" level of success, for example, would not continue for long because the organization would probably experience major upheavals -- staff fired or moved, organizational units reorganized, new leadership brought in from the outside -- before matters deteriorated further to the "Very Poor" level. An "Excellent" rating of "7" is also unrealistic. This is not only because of the growth, change, and complexity of the current I/S environment, but also because managers' expectations of what constitutes excellence (in this or any other function) change as success improves over time.

The range of overall success ratings for the nineteen firms confirms this understanding of the success scale's relevant range. The highest users' rating for a firm was 4.86 (approaching "Good"), while the lowest users' rating was 3.38 (approaching "Inadequate").

However, it does not seem unrealistic to expect that overall success be rated at "5", or "Good", on the scale. Instead, it has been placed by the thousand user and I/S managers nearer "4", the midpoint of the scale. This indicates rather clearly that industry-wide, the I/S function does have a problem with overall success. Not surprisingly, I/S managers rated overall I/S success somewhat more highly (4.43) than did user managers (4.19). Even so, the I/S managers' rating is not a strong endorsement of their own success, as it falls well below a "Good" rating.

RELATIVE STRENGTHS AND WEAKNESSES IN I/S SUCCESS

The average success ratings of the 26 individual criteria are organized in descending sequence in Figure 6. They are distributed across a range that extends from a high of 5.01 (criterion J, developing more Monitor systems) to a low of 3.27 (criterion D, training programs for users). Managers clearly recognize that certain functions and activities within the I/S function, as represented by the 26 success criteria, are relatively more successful than others.

If the success ratings in Figure 6 are partitioned approximately at the midpoint and quartile levels, an interesting pattern emerges. The criteria in each of the four groups are generally related to each other. The first group, those which received the highest success ratings, reflects the traditional technical activities that data processing has engaged in over

FIGURE 6. AVERAGE SUCCESS RATINGS BY CRITERIA

SUCCESS	CRITERIA	DESCRIPTION
5.01	J	DEVELOPING MORE MONITOR SYSTEMS
4.99	H	TECHNICAL COMPETENCE OF THE I/S STAFF
4.85	F	QUALITY OF I/S SYSTEMS ANALYSTS
4.80	E	DATA SECURITY AND PRIVACY
4.71	R	TECHNICAL SOPHISTICATION OF NEW SYSTEMS
4.56	Y	REPORT CONTENTS
4.56	W	AVAILABILITY AND TIMELINESS OF REPORT DELIVERY TO USERS
4.56	B	EFFICIENCY OF HARDWARE UTILIZATION
4.54	K	DEVELOPING MORE EXCEPTION SYSTEMS
4.52	G	THE ATTITUDE OF I/S PERSONNEL TOWARD USERS
4.43	X	RUNNING CURRENT SYSTEMS
4.32	C	HARDWARE AND SYSTEMS DOWNTIME
4.28	Z	I/S PROFITABILITY
4.26	U	I/S SUPPORT FOR USERS IN PREPARING PROPOSALS FOR NEW SYSTEMS
4.25	V	APPROPRIATE I/S BUDGET SIZE OR GROWTH RATE
4.24	A	COMMUNICATION WITH MANAGERIAL USERS
4.22	Q	INCREASING THE PROPORTION OF I/S EFFORT EXPENDED IN CREATING NEW SYSTEMS
4.19	P	I/S STRATEGIC PLANNING AND ALLOCATION OF RESOURCES TO KEY BUSINESS AREAS
4.13	O	RESPONSIVENESS TO USER NEEDS
3.98	S	IMPROVING NEW SYSTEMS DEVELOPMENT
3.97	T	USER ORIENTED SYSTEMS ANALYSTS
3.94	L	DEVELOPING MORE INQUIRY SYSTEMS
3.78	N	INVOLVEMENT OF SENIOR USER MANAGERS IN I/S POLICY
3.72	I	THE NEW SYSTEM BACKLOG
3.57	M	DEVELOPING MORE ANALYSIS SYSTEMS
3.27	D	TRAINING PROGRAMS FOR USERS IN GENERAL I/S

NOTE: AVERAGE COMPANY SUCCESS BY CRITERIA FOR ALL RESPONDENTS

the years. It is not surprising that these criteria are seen to be the most successful of the entire set. The criteria in the second group are associated with the operations of hardware and existing application systems. Again, given the accumulated experience and attention I/S has focused in this area, it is not too surprising that this group is rated by I/S and user managers as an area of relative strength -- though certainly, there is room for improvement.

Below average success ratings comprise the third group. It includes criteria which are associated with I/S management, and the relatively lower ratings suggest comparative weakness. Finally, the last group of ratings involves criteria that are associated with the development of managerial support systems.

A number of observations are suggested by this pattern of the success ratings for the 26 criteria. First, the pattern as a whole makes sense in suggesting that the I/S departments in the nineteen firms are most successful at such traditional technical activities as developing monitoring systems (J), maintaining the technical competence of the I/S staff (H), and establishing technically sophisticated systems (E). The pattern clearly indicates that the I/S function is least successful in activities that require the development of flexible, user-oriented systems, such as inquiry and analysis systems (L,M), as well as the concommitant user-interface capabilities such as user-oriented systems analysts (T), involving senior user managers in I/S policy formation (N), and training programs for users (D). Areas of relative strength occur in efficiency-oriented criteria whereas criteria of relative weakness are associated with effectiveness.

Secondly, the pattern suggests that there may be an experience or learning curve at work in the I/S function, whereby capabilities and procedures improve with management attention, volume, and increased specialization. Operations, for example, used to be a problem in the data processing field. Hardware was inefficiently utilized, system downtime was often a problem, and reports suffered from unsatisfactory timeliness and availability. However, the pattern of success ratings demonstrates that this area is currently one of relative strength, at least as compared with I/S management and the development of more managerial support systems. The pattern indicates that these latter areas, and particularly that of managerial support systems, will require time, resources, and especially management attention before we learn how to implement processes which ensure success.[4]

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[4] See Gibson, C.F., and Nolan, R.L., "Managing the Four Stages of EDP Growth", Harvard Business Review, Jan.-Feb. 1974. Their concept of maturation stages is supportive of this interpretation.

Thirdly, it is striking to note the relative positions of the four different types of information systems: Monitor (J), Exception (K), Inquiry (L), and Analysis (M).[5] The most structured and straightforward of the four system types, Monitor systems, is rated as the most successful of the four. In fact, this activity, with its strong "Good" rating of 5.01, was rated the highest of all 26 criteria. Exception systems, similarly straightforward in their design and implementation, are also rated relatively well; they received an above average rating of 4.54. Inquiry systems and Analysis systems, however, fall into the category of relative weakness. Both are rated in the "Inadequate" range at 3.94 and 3.57, respectively.

The relatively lower success ratings for creating more Inquiry and Analysis systems are due in part to the different development processes which they require.[6] If, for example, the development process for Monitor and Exception systems was equally successful for these more flexible, managerially-oriented system types, it is unlikely that we would see such significant differences in their respective success ratings. In addition to this developmental factor, the relatively lower success ratings for Inquiry and Analysis systems may also be related to a bias against them in the project approval and prioritization process (because they tend to be qualitatively justified).[7] Moreover, the rapid growth in user demand has not allowed sufficient time for the necessary scale-up and training activities that provide a basic capacity to develop such systems.[8]

The relatively low success ratings for these systems, linked with the increasingly strong demand for such systems by user management, suggest that they are likely candidates for top priority improvement efforts in I/S.

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[5] These four types of systems are more fully described in CISR Working Paper #56, op. cit.

[6] Keen, P.G.W. and M.S. Scott Morton, Decision Support Systems: An Organizational Perspective, Addison-Wesley, 1978; and Alloway, R.M., "The Complete Life Cycle of CBIS Projects", Institute of International Business Working Paper, 1976.

[7] Alloway, R.M. and M. Jonikas, "The Project Selection Bias Against Management Support Systems", CISR forthcoming, discusses this and other concepts in relation to a systems development life cycle. Also see Keen, P.G.W., "Value Analysis: Justifying Decision Support Systems", CISR Working Paper #64, M.I.T., Oct. 1980.

[8] Alloway, R.M. and J.T. Nolte, "Planning Skill Development for Systems Analysts", CISR Working Paper #51, M.I.T., March 1980.

The pattern of relative strengths and weaknesses that we have been discussing is based on the data from all nineteen firms collectively. A logical question is whether or not this pattern holds for each of the firms individually or whether it is a distortion, resulting from averaging together nineteen different firms. In fact, as illustrated by Figure 7, the pattern of success ratings that we observed previously does hold for each of the individual firms as well.

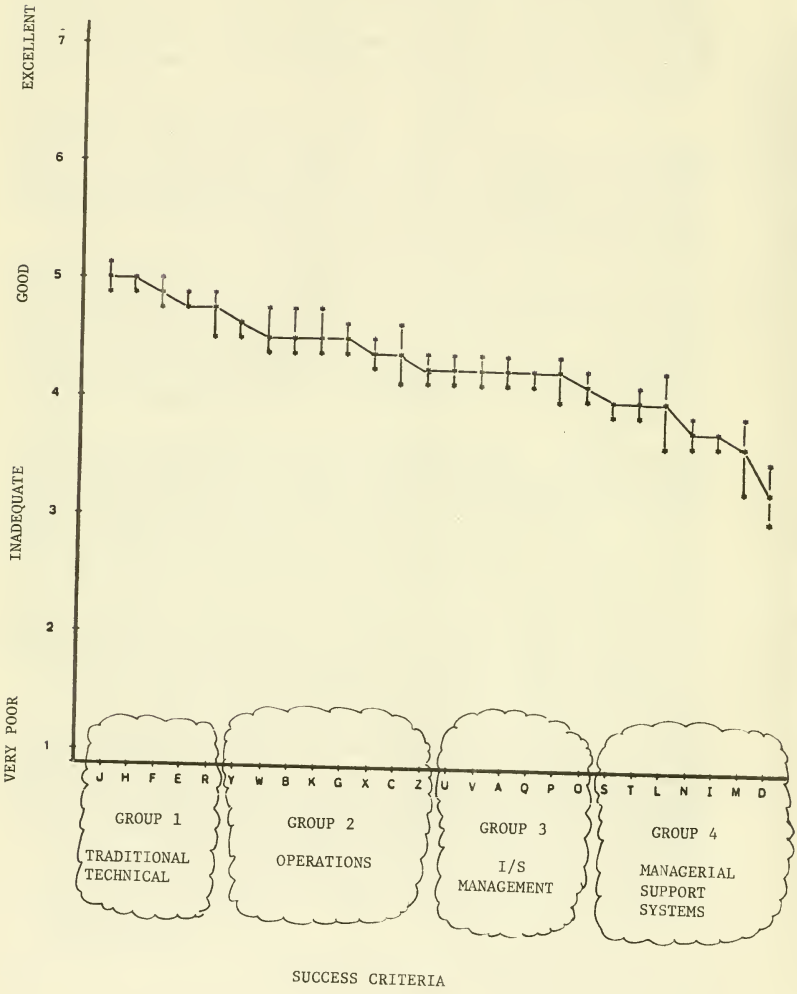
In Figure 7, the variance of the nineteen firms' individual success ratings about the average is shown for each of the 26 individual criteria. The solid line sloping downward is the same average success ratings, in the same sequence, as listed in Figure 6 on page 12. The vertical bars show that the ratings from the nineteen firms for each criterion do have some variation around the average success rating.

It is striking to note, however, that the company variation within each criterion is much smaller than the range of average success ratings across the spectrum of the 26 criteria. In other words, the pattern that we observed in Figure 6 holds reasonably well for each of the nineteen individual firms. Although there is some variation within each criterion, this variation appears to exist in the context of a central theme, or general pattern of I/S strengths and weaknesses.

Using the four success groupings identified earlier, we can see that the bottom of the vertical lines for traditional technical activities (average rating less the variance by firm) is still higher than the top of most of the vertical lines for operations (average rating plus variance by firm), and exceeds by even greater margins the highest ratings in the third and fourth groups, I/S management and managerial systems development. More specifically, the lowest rating for criterion J (developing more Monitor systems) is still higher than the highest rating for criterion K (developing more Exception systems) and is much higher than the managerial support systems, criterion L (developing more Inquiry systems) and criterion M (developing more Analysis systems) in the group comprising managerial support systems development.

Essentially, then, Figure 7 demonstrates that none of the nineteen companies deviates very far from the general pattern which we have identified for the sample as a whole. This general adherence to the pattern of success ratings is an important observation, since it takes place despite the diversity among these firms in industry classification, organizational size, and size and structure of the I/S department.

FIGURE 7. AVERAGE COMPANY SUCCESS RATINGS BY CRITERIA
PLUS AND MINUS VARIANCE



A brief recapitulation may be helpful at this point. In order to assess the success of the I/S function, a definition of success was developed which encompassed both the performance and the relative importance of 26 separate criteria representing the breadth and diversity of I/S responsibilities. Using this definition of I/S success, data was collected from 1058 user and I/S managers in nineteen different industrial firms. The resulting analysis of this data suggests that, in fact, there is a pervasive problem with I/S success. The average overall success rating is only 4.28, statistically significant and managerially different from a "Good" rating of "5" on the scale.

In addition, we have found that user managers' success ratings by company range from "inadequate" (3.28) to "good" (4.86), reflecting the differences commonly observed between I/S departments. The range of success by criterion is even greater, from 3.27 for criterion D (training programs for users) to 5.01 for criterion J (developing more Monitor systems). Within this range of success, a general pattern of relative strengths and weaknesses across the 26 success criteria is readily observed. Efficiency-oriented criteria relating to traditional technical activities and I/S operations have been rated as more successful than the effectiveness-oriented criteria associated with management of the I/S function and development of managerial support systems. This is a pattern which holds not only for the nineteen firms collectively, but, with minor variations, for each individual firm as well.

It is definitely helpful to define and measure success for the I/S function as a whole, especially in reference to relative importance as well as performance. Historically we in the I/S function have measured performance without attention to relative importance. Moreover, we have made it difficult to make trade-off decisions by measuring single criteria without reference to others that are also important. But perhaps most perilously, we have focused our attention within the I/S department, failing to emphasize the opinions of middle and senior level user managers. The User Needs Survey methodology is designed to compensate for these typical shortcomings. With an integrated definition of success and the combined opinions of user and I/S managers we can aspire to better understand the underlying dynamics or causes of low success in the I/S function.

The previous section discussed the definition and measurement of I/S success and the pattern of relative strengths and weaknesses from the point of view of I/S and user managers collectively. In this section, we will contrast the respective ratings of user and I/S managers to determine whether there are significant differences in their opinions that will help to explain the overall low success rating.

Disagreement and conflict between user and I/S opinions regarding success by criteria is a potential and appealing explanation for the problem of low I/S success. It is possible, for example, that user managers simply do not understand I/S functions well enough to evaluate their success. Hence, user ratings, which constitute sixty percent of the sample, might unfairly bias the result.

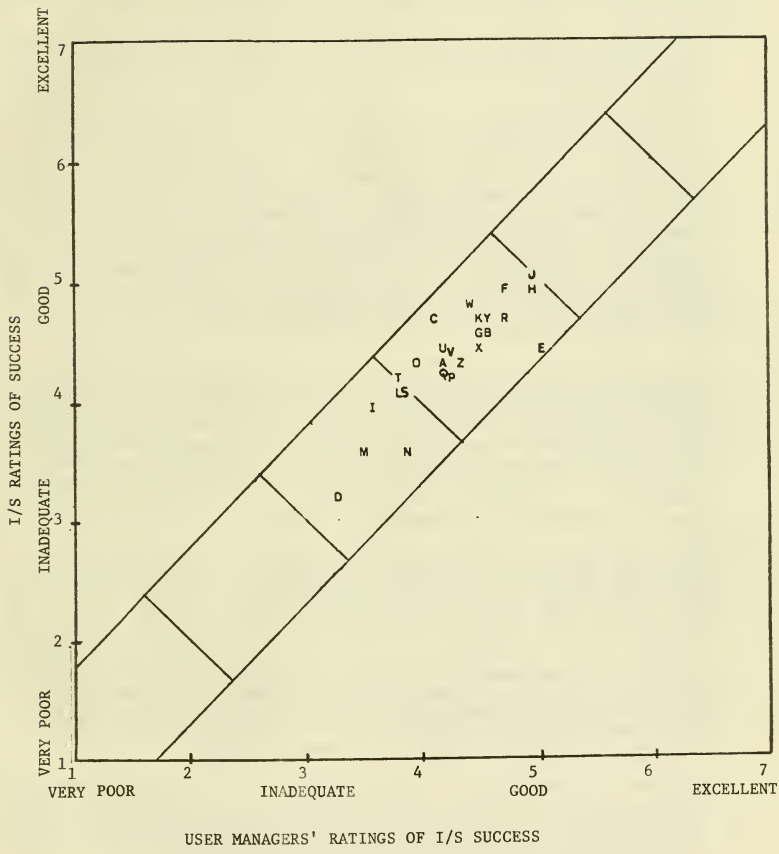
Alternatively, it is possible that user managers and I/S managers simply disagree on the components of success: importance or performance. Users may differ from I/S regarding the importance of various criteria, for example, because they may be unrealistic and naive about the technical prerequisites for success. Conversely, differences between I/S and user importance ratings may result from I/S's lack of understanding or concern with users' needs. Moreover, I/S and user managers may have different standards of "good" performance or may even disagree on the actual level of current performance. In any case, discovering a disparity between user and I/S assessments would help us considerably in understanding the underlying dynamic causing low I/S success.

DO USER AND I/S MANAGERS DISAGREE ON SUCCESS?

The consensus of popular opinion, as well as the frequent judgment of I/S professionals, holds that users and I/S managers disagree on nearly everything, particularly on the success of I/S. The User Needs Survey results suggest, in contrast, that there is a remarkable degree of similarity in the two groups' assessments of success for each of the 26 criteria.

Figure 8 provides a graphic representation of this surprising, and encouraging, agreement between I/S and user managers. If user and I/S success ratings for the 26 criteria were exactly the same, the letters A through Z (representing each of the criteria listed in Figure 3 on page 6) would lie in a straight diagonal line on the graph. From a statistical perspective, the Spearman Rho correlation coefficient would be 1.00. In fact, the correlation coefficient is 0.85 at a significance level of .0001 (indicating that there is one chance in 10,000

FIGURE 8. COMPARISON OF I/S AND USER RATINGS OF SUCCESS



NOTE: AVERAGE OF COMPANY SUCCESS RATINGS BY CRITERIA.
CORRELATION COEFFICIENT = .85 AT .0001 SIGNIFICANCE LEVEL.

that the coefficient is not 0.85). Graphically, the plots for the 26 criteria are rather tightly clustered along the diagonal. Whereas the statistics prove the point, the graphical representation in Figure 8 illustrates that there is a high degree of agreement between user and I/S managers about the relative success of the 26 I/S criteria.

Further, the graphic pattern indicates that user and I/S managers agree that the success for all the 26 criteria is in the middle range of "3" to "5" on the rating scale. None of the success criteria fall below the "inadequate" level. Further, the two groups agree on those criteria with the lowest success: training programs for users (D), developing more analysis systems (M), involvement of senior user managers in I/S policy formulation (N), and the new system request backlog (I). They also agree that none of the 26 criteria enjoys "excellent" success. There is room for improvement on even the most successful criteria. Notice that only a few (particularly criterion J, developing more Monitor systems, and criterion H, technical competence of the I/S staff) are assessed by both groups at a success level which may be described as "Good" on the rating scale. This pattern confirms the earlier finding that there is a problem with overall I/S success.

This excellent agreement between the two groups of managers regarding the 26 criteria for success indicates that the problem of low success cannot be found simply in disagreements between users and I/S professionals. While this discovery does not provide insight into the underlying cause of low success, the determination that users and I/S managers share similar assessments of overall I/S success is, in itself, an important finding. If recognized and utilized it provides an invaluable basis for cooperative improvement efforts.

The implications of this finding are provocative. First, user managers can and do discriminate between different I/S criteria. Even though user managers rate overall I/S success as mediocre, this does not mean that they uniformly rate all aspects of I/S equally. Further, user managers have little difficulty in judging success even on technically-oriented criteria. User managers may not personally possess these technical skills, but the survey results demonstrate that they are quite capable of assessing technical capabilities. In fact, they appear to be as capable as I/S managers in judging technical competence at this macro, managerial level.

Second, and contrary to popular belief, I/S managers are not out of touch with their user communities. It would be easy for I/S managers to overrate their own success. Fortunately, this industry sample of I/S managers is actively interested in their users' needs and has avoided "the I/S isolation trap".

The third provocative implication of Figure 8 concerns prospects for the future. The agreement we found in these nineteen firms suggests that there is a solid basis for the resolution

of current and future problems between I/S and users. The shared assessment of I/S success, not only in the aggregate, but for each of the 26 individual criteria as well, indicates that a common definition of the problem exists. A necessary prerequisite for improvement is a shared understanding of what constitutues success and an explicit agreement on where the problems are. For these nineteen firms collectively, and probably for I/S as an industry, this crucial condition and foundation for future joint planning and action is well met.[9]

DO USER AND I/S MANAGERS DISAGREE ON IMPORTANCE?

Although user and I/S managers agree on the relative success of each of the 26 criteria, it is possible that there are major disagreements in their ratings of relative importance. If so, this would be a significant finding, in that it would provide a better understanding of the overall low success and a basis for the development of I/S priorities. For example, I/S managers might rate only technical considerations as very important. Conversely, user managers may rate only those criteria which are associated with their direct interests and needs as very important.

Figure 9 provides a graphic representation of user and I/S importance ratings for the 26 success criteria. Once again, the plots of user and I/S ratings for each criterion fall closely along the diagnonal that represents perfect agreement.[10] Again we have found a pattern of remarkable agreement between user and I/S managers.

There is no real disagreement about what is important for I/S. What I/S professionals think is important is also viewed by user managers as important; and, equally impressive, what user managers think is important is similarly evaluated by I/S managers. Once again we have an unanticipated and positive indication that user and I/S managers are not far apart in their assessments of the I/S function.

Whether I/S has influenced users or users have influenced I/S is immaterial. The fact remains that user and I/S managers in these nineteen firms, and perhaps throughout the industry, agree on what is and is not important for the I/S function.

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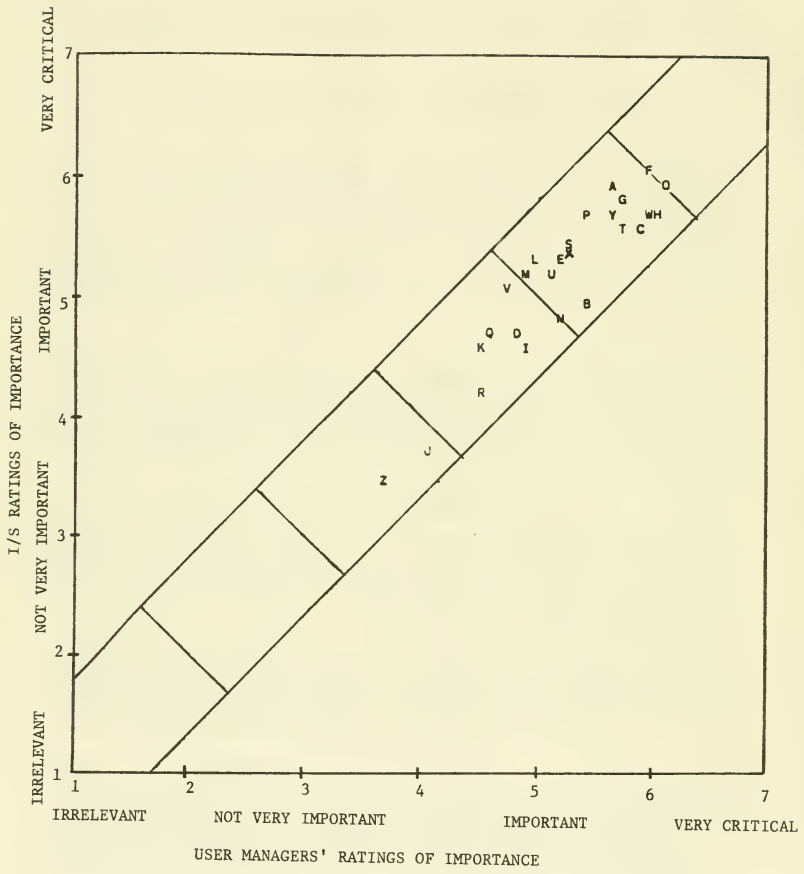
[9] Caution: This is not true for all firms individually. In the User Needs Survey, several I/S departments with the lowest success did not show this prerequisite for improvement.

[10] The Spearman Rho correlation coefficient in this case is .93, at a significance level of .0001.

FIGURE 9. COMPARISON OF I/S AND USER RATINGS OF IMPORTANCE



NOTE: AVERAGE OF COMPANY IMPORTANCE RATINGS BY CRITERIA.
CORRELATION COEFFICIENT = .93 AT .0001 SIGNIFICANCE LEVEL.

We have explored two possible explanations for low ratings of I/S success only to find strong agreement between user and I/S managers. A third alternative is possible, and would seem quite likely. Perhaps I/S managers and user managers disagree on the performance component of success. Such a finding would indicate that either they disagree on how well I/S actually is performing, or they disagree on what level of actual performance is acceptable.

We employ the now familiar graphic technique to check this hypothesis. And again, as shown in Figure 10, we find the same diagonal clustering of the 26 criteria which indicates excellent agreement between the two groups.[11] Evidently the cause of low success is not to be found in disagreements between users and I/S managers on either the actual level of performance or its acceptability.

Although we have yet to find any clarification of the low success ratings in differences of opinion between users and I/S professionals, we have again discovered some encouraging results. In spite of their different organizational positions and interests, users and I/S managers have very similar views of the actual performance of all the I/S success criteria. Although one criterion is rated slightly higher in performance by user managers (criterion E, data security and privacy), and some are rated marginally higher by I/S managers (e.g., criterion C, hardware and system downtime), all of the performance ratings fall within the diagonal band illustrating agreement.

Success criterion C (hardware and systems downtime) is, in fact, an interesting example of this basic agreement between the two groups. It is quite possible that the same percentage of downtime would be rated quite differently by users and I/S managers. A rate of 5% downtime, for example, might be considered unsatisfactory by user management and, at the same time, be considered quite good by I/S management. Instead, both management groups rate the performance of system downtime approximately the same.

The surprising implication of this agreement on criterion C, as well as the agreement on other technically-oriented criteria, is that user managers do not differ significantly from I/S professionals in their assessment of the technical performance of the I/S function. In fact, it appears that they, like I/S managers, have a realistic understanding of what constitutes good performance in the technical arena of I/S activities. Conversely, it is important to note that I/S managers appear to be

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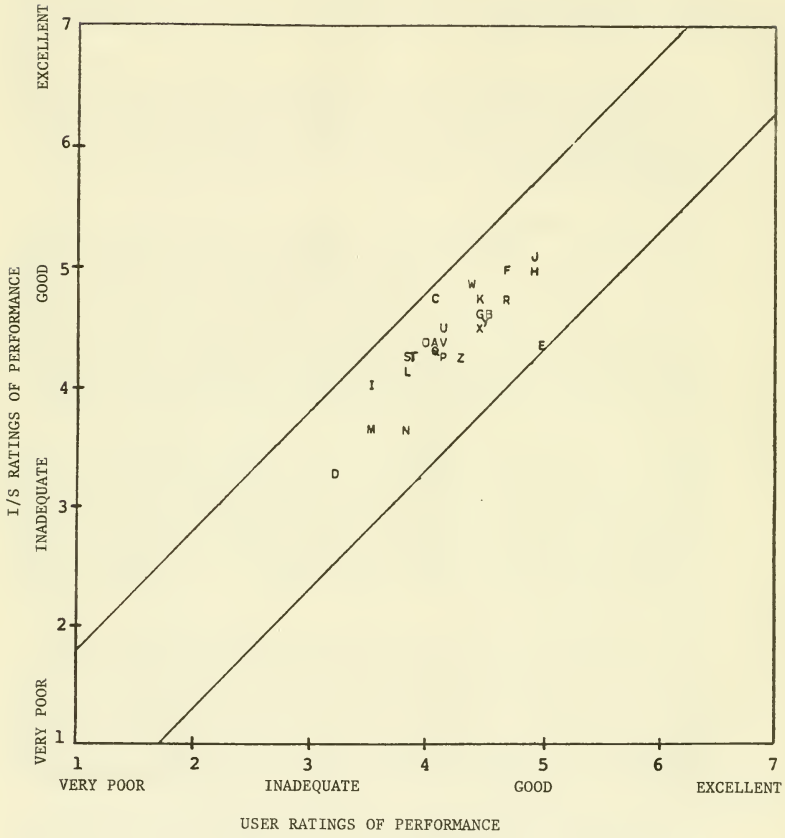
[11] The Spearman Rho correlation coefficient for the two sets of performance ratings is .85, at the .0001 significance level.

FIGURE 10. COMPARISON OF I/S AND USER RATINGS OF PERFORMANCE



NOTE: AVERAGE OF COMPANY PERFORMANCE RATINGS BY CRITERIA.
CORRELATION COEFFICIENT = .85 AT .0001 SIGNIFICANCE LEVEL.

as sensitive as user managers to the performance issues associated with non-technical, user-oriented criteria, such as, the attitude of I/S personnel toward users (G), I/S support for users in preparing proposals for new systems (U) and training programs for users (D).

The fact that all of these criteria, which represent a diverse range of I/S issues, are rated similarly by user and I/S managers suggests that certain stereotypes about the two groups may not be entirely valid. Users, for example, are usually viewed as unsophisticated in I/S technical matters. However, their judgment of technical I/S performance closely matches that of the I/S professionals themselves. On the other hand, I/S personnel are traditionally considered to be insensitive to user needs and requirements. Yet, they demonstrate an assessment of performance for user-related criteria that is remarkably close to that of user managers themselves.

INTERMEDIATE SUMMARY

Although we have still to discover the underlying dynamic which accounts for the relatively low success ratings of the I/S function, we continue to find heartening, encouraging patterns suggesting major areas of agreement between user and I/S managers as they assess the success, importance, and performance of the 26 criteria.

The question remains, however. What is the underlying "cause" of low I/S success? We have found that user managers and I/S managers rate overall I/S success as marginal. Further, based on the success ratings for the individual criteria, we found a general pattern which separates them into four groupings: traditional technical, operations and control, I/S management, and managerial support systems development. In searching for some underlying dynamic that would explain these success ratings, we have explored three alternatives, each one focusing on possible differences of opinion between user and I/S managers. We have compared user and I/S manager ratings of success, importance, and performance, and we have found remarkable agreement. The implication of this is that we must look elsewhere if we are to find the underlying cause of low I/S success. It cannot be explained as a difference of opinion between I/S and user managers.

To no avail, we have analyzed each of the possible differences between user and I/S opinions, hoping to find a significant difference that could cause the low success ratings for individual criterion and the I/S function as a whole. Contrary to popular opinion, however, the cause is not to be found in I/S versus user differences of opinion. Pursuing a completely different tack, we compared users' ratings of importance with users' ratings of performance. This comparison is the key to our understanding the cause of low I/S success.

Figure 11 illustrates this diagnostic technique. It is essentially the same technique we have used earlier, except that now we are comparing users' ratings of importance with users' ratings of performance. As in previous graphs, good agreement would result in a diagonal pattern. But the image of Figure 11 is strikingly different from that of previous graphs. Rather than falling along the diagonal, the plots of the 26 criteria are randomly scattered. In contrast to the excellent correlation statistics for previous graphs, the correlation coefficient for Figure 11 is almost zero (.08) and is not even close to being statistically significant (.70). Clearly we have found a dramatic departure from the previous patterns of close agreement.[12]

This random scatter of importance and performance ratings discloses that user managers see no relationship between the importance of a particular criterion and its corresponding performance. For example, two criteria that are rated at widely different levels of performance, low-rated M (developing more Analysis systems) and high-rated E (data security and privacy) have almost the same importance ratings. Conversely, two criteria which users judge to be equal in performance, criteria Z (I/S profitability) and W (availability and timeliness of report delivery) are seen by users as being very different in importance. This relationship is not only statistically random, but more critically, managerially unacceptable.

From the users' perspective, then, it appears that whatever performance I/S has achieved has not, unfortunately, been related to importance. Simply put, user managers do not see a

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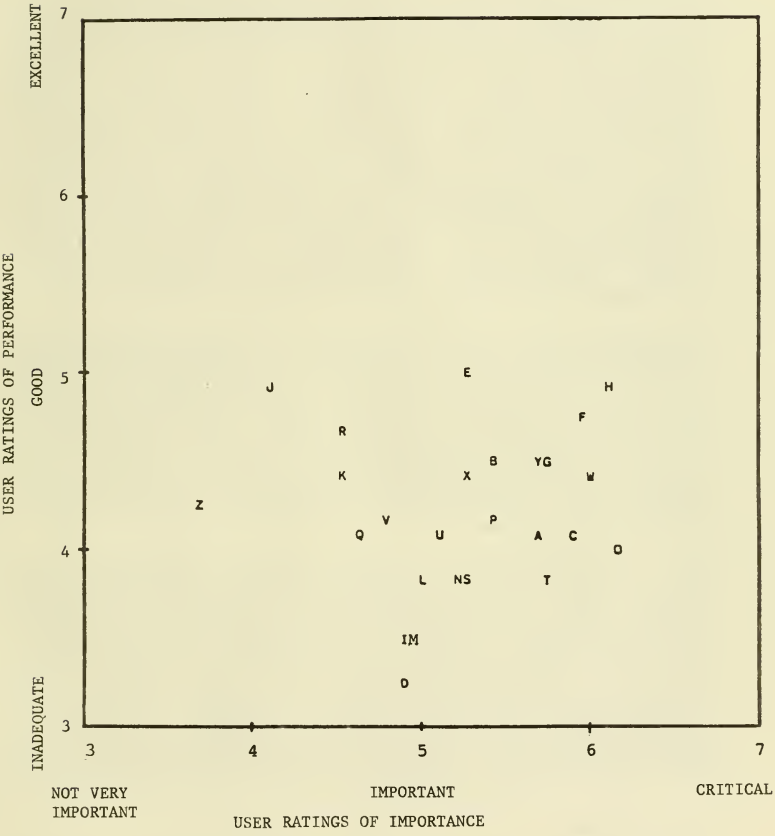
[12] It should be noted that the range of the scale in Figure 11 has been changed from the original "1" to "7" range, to a reduced range of "3" to "7". This change has been made solely to illustrate the randomness more effectively. The correlation statistic verifies in two ways this randomness. First the low Spearman Rho correlation coefficient (.08) indicates a lack of any meaningful relationship. Second, the high value of the significance level (.70) indicates little confidence in any kind of relationship.

FIGURE 11. COMPARISON OF USER RATINGS OF IMPORTANCE AND PERFORMANCE



NOTE: AVERAGE OF COMPANY PERFORMANCE AND IMPORTANCE RATINGS BY CRITERIA. CORRELATION COEFFICIENT = .08 AT .70 SIGNIFICANCE LEVEL.

pattern that relates performance to importance. It is not that all high performing criteria are unimportant; rather, the justifiable expectation that they should consistantly tend to be important is not fulfilled. At least from the vantage point of user managers, there appears to be no relationship between the two considerations for most criteria.

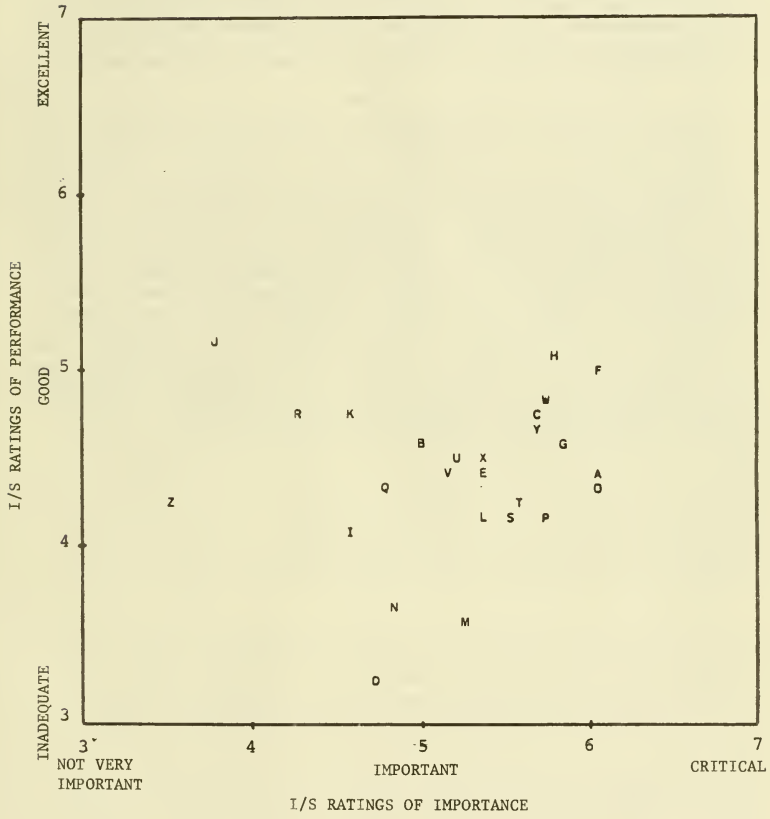
As further illustration of this lack of relationship between users' ratings of importance and performance consider criteria J, K, L, and M which are the four different types of information systems: Monitor, Exception, Inquiry, and Analysis. When the importance/performance pairings are compared for the four different systems types, there actually appears to be an inverse relationship between the two factors -- the more important the system type, the lower its rating of performance. Developing more Monitor systems (J) is judged by users to be least important of the four. Yet users clearly evaluate I/S as having higher performance on criteria J. Developing more Exception systems (K) is considered to be somewhat more important than criterion J. However, I/S is evaluated by users as having performed less well on criterion K than on J. And for the two most important system types, Inquiry and Analysis systems (criteria L and M, respectively), I/S performance is judged by users as the lowest for all systems types.

The results of this analysis suggest that we have uncovered the underlying cause which is reponsible, at least in the opinion of user managers, for the phenomenon of low success. User managers see no relationship between the importance and performance of most success criteria. This is an I/S strategic planning and resource allocation problem. The I/S function has not set its goals and allocated its resources such that those criteria of greatest importance have acceptable levels of performance. I/S management may have been trying to achieve a balance between importance and performance, but to date it has not been accomplished.

But do I/S managers see the same cause for low success? Or do their ratings indicate a closer alignment of performance and importance for the 26 success criteria? Figure 12 provides the answer. Again we see an undeniably random dispersion of importance/performance criteria on the graph.[13] I/S managers agree with users; they do not see any justifiable relationship between the two dimensions of success. What is important may or may not have high performance, and criteria with high performance may or may not be relatively important. For example, I/S managers see the same inverse relationship between importance and performance that user managers perceived for the four major system types. The less important system types, Monitor

[13] The Spearman Rho correlation statistics (coefficient of .10, at a significance level of .62) again demonstrate the randomness of this plot.

FIGURE 12. COMPARISON OF I/S RATINGS OF IMPORTANCE AND PERFORMANCE



NOTE: AVERAGE COMPANY PERFORMANCE AND IMPORTANCE RATINGS BY CRITERIA.
CORRELATION COEFFICIENT = .10 AT .62 SIGNIFICANCE LEVEL.

(J) and Exception (K), have higher performance than the more important system types, Inquiry (L) and Analysis (M).

It appears from the results of Figure 11 and Figure 12 that we have finally uncovered the basic dynamic which accounts for both I/S and users' low ratings of I/S success. Neither group of managers sees any relationship between the two critical components of success, the importance and the performance of a particular criterion. It is as though one of the basic tenets of management, allocating resources to align performance with importance, is being violated. Further, it is striking that both management groups perceive the situation in the same way.

This underlying imbalance between importance and performance ratings raises serious questions about the I/S planning process for the firms participating in the User Needs Survey and, presumably, for other firms as well. The results suggest that the I/S function has not succeeded in the past, for whatever reason, in improving its performance on those things that are judged to be important by both I/S and user managers. Although it is likely that many I/S managers have not yet recognized importance-performance discrepancies as the cause of low success, it is also true that many I/S managers already have been trying to change the importance-performance gaps they do perceive. Despite the best efforts of individual managers, policy, procedure and priority changes will not occur until there is a broad-based understanding of the problem. Our findings indicate that this imbalance between importance and performance will continue until a process is established which provides a basis for communication and an explicit methodology for problem diagnosis and priority setting.

The underlying cause of low success, as identified in the previous section, is lack of a consistent relationship between importance and performance for the 26 criteria of I/S success. We have seen that high ratings of importance are often associated with low ratings of performance. Conversely low ratings of importance are often associated with relatively high ratings of performance. In effect we are observing a gap between importance and performance ratings. Instead of being approximately equal, one rating is often larger than the other.

IMPORTANCE/PERFORMANCE GAPS AND PRIORITIES

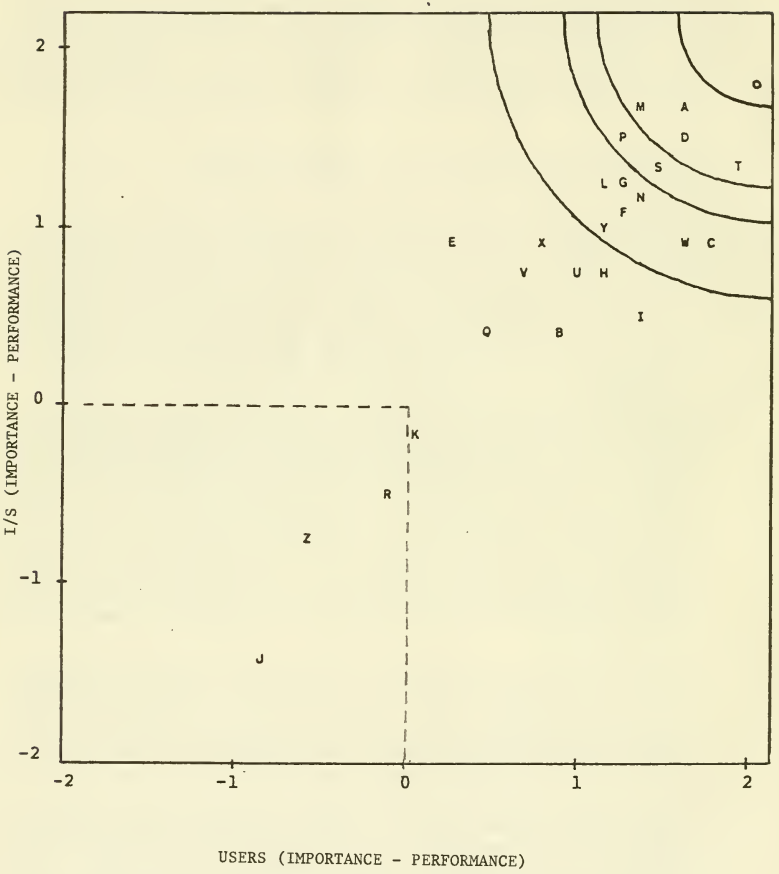
A gap between the two ratings of importance and performance is not found for all 26 criteria, though it does appear in the great majority of paired ratings. In some cases the importance rating is relatively higher than the performance rating, while in others the opposite is true. By understanding the characteristics of these gaps between importance and performance ratings, we can begin to identify the key areas for I/S improvement, in other words, the top priorities for the I/S function.

Figure 13 provides a graphic representation of the gaps between importance and performance ratings for each of the 26 success criteria. For each criterion, the rating of performance has been subtracted from the rating of importance. If the resulting gap is positive, it indicates that the importance rating for that particular criterion exceeded its rating of performance. If the gap is negative, it indicates that the importance rating was actually less than the associated performance rating. This computation of importance-performance gaps has been done for both groups of managers, users and I/S alike, with the resulting gaps shown on the chart represented in Figure 13.

Once again we see the familiar diagonal clustering pattern, indicating agreement between user managers and I/S managers. This time, however, the agreement is not on ratings of importance alone or performance alone. Rather, the agreement illustrated in Figure 13 concerns the difference between the two ratings: the importance-performance gap.

Using these importance-performance gaps, we can now determine the top priorities for I/S. Those criteria which have the largest gap between importance and performance ought to be the primary focus of our efforts to improve I/S success. These criteria, which appear in the upper right corner of the graph are held by I/S and user managers alike to be of high importance

FIGURE 13. IMPORTANCE - PERFORMANCE GAPS FOR I/S AND USERS



NOTE: AVERAGE OF COMPANY (IMPORTANCE - PERFORMANCE) RATINGS BY CRITERIA.

and to have experienced relatively low performance. These are the criteria which should receive the most attention and resources in order to raise the overall success ratings of the I/S function.

The criteria whose ratings of performance exceed their ratings of importance appear in the lower-left corner of the graph. They have negative importance-performance gaps. These are the criteria which I/S and user managers agree are relatively low in importance, but which they also rate as relatively high in performance. It is important to note, however, that the performance ratings for these criteria are high only in the relative sense as none of the criteria (as we saw in Figure 10 on page 24) have a rating much higher than "good" or "5" on the seven-point scale.

The criteria appearing in the lower-left corner of the chart should not be considered as priorities, given limited I/S resources. Even though there is room for improvement, the relatively low importance ratings for these criteria would suggest that these areas are experiencing something of an "over-performance" in relation to their importance. To further concentrate on improving performance in these areas would be a waste of scarce management time and I/S resources.

For example, criterion J (developing more Monitor systems) has a relatively high performance rating; however, additional resources and attention could be devoted to raise it even higher, perhaps even to the truly excellent range of a 6 or 7. The wisdom of such action would, however, be highly suspect since the importance of developing more monitoring systems was rated at a relatively low level. Hence, this criterion and others like it should not be considered as high I/S priorities for improvement. Instead, it would seem more appropriate to opt for a "holding action" which would maintain their actual level of performance. Obviously, importance and performance ratings are all relative and I/S management should carefully consider the consequences before reducing the actual level of performance on any criterion.

DETERMINING LEVELS OF PRIORITY

The high priority criteria in the upper-right corner of Figure 13 require closer examination, in order to identify levels of priority that can be used in developing an action plan for increased I/S success. On Figure 13, semi-circles have been drawn rather arbitrarily to define four levels of priority for the fourteen criteria with the largest importance-performance gaps.

Figure 14 summarizes this grouping of the criteria into four priority levels. It is important, at this point, to

FIGURE 14. PRIORITIES FOR ACTION

TOP PRIORITY

O. RESPONSIVENESS TO USER NEEDS

SECOND PRIORITY

M. DEVELOPING MORE ANALYSIS SYSTEMS

A. COMMUNICATION WITH MANAGERIAL USERS

D. TRAINING PROGRAMS FOR USERS IN GENERAL I/S CAPABILITIES

T. USER ORIENTED SYSTEMS ANALYSTS WHO KNOW USER OPERATIONS

THIRD PRIORITY

P. I/S STRATEGIC PLANNING AND ALLOCATION OF RESOURCES TO KEY BUSINESS AREAS

S. IMPROVING NEW SYSTEM DEVELOPMENT (TIME, COST, QUALITY, DISRUPTIONS)

FOURTH PRIORITY

L. DEVELOPING MORE INQUIRY SYSTEMS

G. THE ATTITUDE OF I/S PERSONNEL TOWARD USERS

N. INVOLVEMENT OF SENIOR USER MANAGERS IN I/S POLICY FORMULATION AND EVALUATION

Y. REPORT CONTENTS (RELEVANCE, CURRENTNESS, FLEXIBILITY, ACCURACY)

F. QUALITY OF I/S SYSTEMS ANALYSTS

W. AVAILABILITY AND TIMELINESS OF REPORT DELIVERY TO USERS

C. HARDWARE AND SYSTEMS DOWNTIME

re-emphasize that this set of priorities is not a theoretical construct. Rather, it has been derived from the opinions of an industry-wide sampling of a thousand user and I/S managers. Further, as we have seen in previous sections, the opinions of these managers have been sophisticated and discriminating. What we have uncovered through our analysis of the differences between the ratings of importance and performance, the importance-performance gaps, is, therefore, a widespread and consistent set of priorities for improving I/S success.

The first item on this agenda for improved I/S success is criterion O, responsiveness to user needs. This criterion's position of foremost priority is not a trivial restatement of the obvious. Instead, it may well be an indication of the stage of I/S development for these nineteen firms. Most of them can generally be characterized in the Nolan framework as having made the transition from the third stage, with its emphasis on control, efficiency, and cost containment, to the fourth stage of maturity, with its new emphasis on responsiveness to user needs.[14]

Successfully achieving responsiveness to user needs will necessarily include the related activities represented by the second, third and fourth levels of priority in Figure 14. For example, increased responsiveness to user needs will require the development of more Analysis systems (criterion M) and more Inquiry systems (L). The development of these systems types, however, will depend in turn on progress on other top priority criteria, such as training programs for users (D) and user-oriented systems analysts who know user operations (T). In addition, criteria associated with user involvement in I/S planning, such as communication with managerial users (A), I/S strategic planning and allocation of resources to key business areas (P), and involvement of senior user managers in I/S policy formulation (N), will also be critical to the first priority of responsiveness to user needs, and therefore to a successful fourth-stage I/S function.

IMPROVEMENT EFFORTS FOR INCREASED I/S SUCCESS

The recommended top priorities for improvement of I/S success are unequivocal and hence of considerable help in I/S goal setting and resource allocation. However, simultaneously undertaking improvement efforts on these fourteen high priority criteria is at least formidable, and perhaps overwhelming. It will probably take several years before a plan of action for each is developed and implemented.

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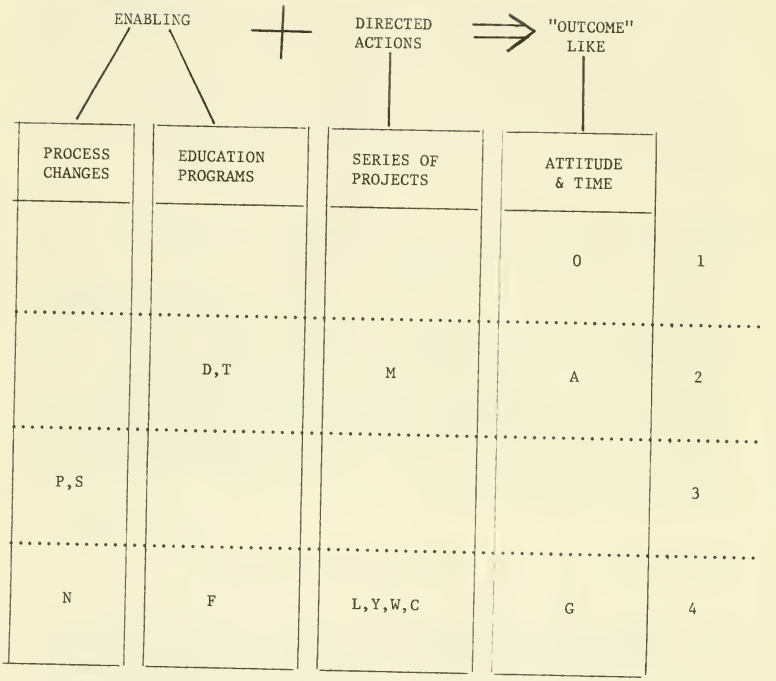
[14] Gibson and Nolan, op.cit.

FIGURE 15. I/S IMPROVEMENT EFFORTS



In addition to determining levels of priority as a basis for I/S planning, it is also possible to discern certain themes that emerge across the top priority criteria. These themes, as illustrated in Figure 15, are really different categories of improvement efforts. For example, certain of the top priority criteria can be viewed as Enabling efforts, while others are more discrete Directed Actions. Both of these types of improvement efforts contribute to the more subjective, yet extremely significant, Outcomes.

Thus, the top fourteen priority criteria can be grouped in a useful manner to facilitate developing I/S plans. First, several criteria relate to process changes and the building of an improved infrastructure. They are "enabling" conditions which, when present, make it easier to succeed on the other more task-oriented criteria. Education programs and changes in managerial procedures fall into this Enabling category. These efforts require an investment of time and resources for future successes in other areas. As such, they require a longer term perspective and will yield invisible, dispersed, but significant benefits.

The Enabling efforts can be interpreted to consist of two kinds. The first covers criteria which involve process changes: I/S strategic planning (P), improving the new systems development process (S), and involvement of senior user managers in I/S policy formulation (N). Each of these criteria is associated with developing new processes for planning and developing systems. They have in common a concern for changing approaches and methods, rather than attending to specific projects or actions. These process changes would provide a foundation or a capacity for future growth and development.

Education programs constitute the second type of Enabling activity. Each of these three criteria highlights the need for cross-functional education and training of user and systems personnel as a basis for future I/S improvement. User-oriented systems analysts who know user operations (T) and the quality of systems analysts (F) are priority criteria which require concentrated training and educational efforts in order to increase the underlying capacity of I/S to perform its function successfully. Similarly, training programs for users in general I/S capabilities (D) provide a basis for their understanding of the potentials and limitations of the I/S function. This is a user capability which is critical for the successful realization of such Directed Action criteria as developing more Analysis systems (M) and of such Outcome criteria as communication with managerial users (A). Each of these education-related Enabling efforts, therefore, should be considered when planning improvement efforts for increased I/S success.

The ability to expend organizational resources on such long-term benefits necessitates a credibility which is based upon current success. For this reason, it is important to

undertake Directed Actions which can provide a "protective umbrella" for the longer-term Enabling efforts.

The Directed Actions category includes priority criteria that involve a variety of specific actions, each of which can be structured as a discrete project. These task-oriented projects are visible, concrete, and should have a more immediate payback. Two of these efforts are associated with developing particular system types: Analysis systems (M) and Inquiry systems (L). Both of these directed actions would, inevitably, contribute to the overall outcome of responsiveness to users needs (O) and should therefore be considered as critical components of an I/S strategic plan.

In addition, there are other Directed Actions which will contribute over time to greater success on the Outcome criteria. Specific projects that increase the relevance, timeliness, flexibility, and accuracy of reports (Y, W) will undoubtedly contribute to improved success for such Outcome criteria as responsiveness to user needs (O) and attitudes of users to I/S (G). Reducing hardware and system downtime (C), especially as more on-line Inquiry and Analysis systems are installed, will support these Outcome criteria as well.

Finally, several top priority criteria are less tangible as they involve attitudes and communication and are therefore much more difficult to address directly. These "outcome-like" criteria are not susceptible to brute force resource allocation. Nonetheless, they can be improved through an explicit recognition by I/S managers that these issues constitute top priority aspects of their own job descriptions.

Fortunately, none of these types of criteria are in conflict with one another. As Enabling conditions improve, it will be easier to succeed in Directed Action and Outcome-like criteria. As Directed Action projects are successfully implemented, Outcome-like attitudes and cooperation on Enabling activities will improve. As Outcome-like attitudes improve, it will be easier to invest in Enabling conditions and achieve effective cooperation on Directed Action projects. Because of these interrelationships, it is important to review each area carefully, and begin planning for the specific activities and efforts which will facilitate their implementation.

The top priorities that we have just identified provide us with a mandate for improving the overall success of the I/S function. In effect, this set of priorities and improvement efforts represents the collective judgement of key I/S professionals and user managers, in typical private sector settings, about what needs to be addressed to improve I/S success.

And, as we have seen continuously throughout this paper, the collective judgment of I/S and user managers is remarkably consistent. Not only do the two groups agree on ratings of I/S succcess but they also share similar assessments of the two basic components of success -- importance and performance. And perhaps most notable, they both perceive the same underlying cause of low success -- the lack of a managerially justifiable relationship between importance and performance. With such similar perceptions of importance-performance gaps, the top priorities for improving I/S success are remarkably clear. They represent, in effect, a bipartisan plan for improving overall I/S success.

Given the strong agreement between I/S professionals and user managers, it appears that our focus should now be on action: both short-term directed actions like developing more inquiry and analysis systems; and also longer-term, investment-oriented enabling efforts like training programs, improving the new systems development process, and implementing better methods for I/S planning and resource allocation. These efforts must begin together, however, for the directed actions should provide the short-term success and credibility that will allow for the longer-term investment of the enabling efforts.

None of these actions is overwhelmingly difficult. Although the specific techniques and methodologies may still be evolving, our difficulty in accomplishing such actions may lie more in our inability to focus our efforts than in our lack of experience or expertise. The techniques and methods can be learned, can be experimented with, and will continue to develop. What is important is that we begin the effort, that we focus our discretionary efforts and resources on those specific criteria which I/S and user managers agree are of top priority.

It is important to acknowledge, however, that we can never expect to achieve uniformly high success ratings across all 26 criteria. There will always be areas of I/S activity which will experience relatively low success (by definition the relative success on some criteria must be below average). Therefore, the I/S function will always have areas with relative need for improvement.

In addition, we can anticipate that the rating scale will continue to experience an inflation of expectations. As the I/S function increases its success, more will be expected of it. This phenomenon is certainly familiar to I/S managers who, because of past successes, are subject to the continued expectation for more and greater success (e.g., What have you done for us lately?). The result is that the entire rating scale is continuously adjusted upwards in the minds of both user and I/S managers.

In spite of these two reasons which will insure that the I/S function never achieves perfect success, the techniques and findings that we have established in this research suggest that there is a way to maximize relative overall success. By defining I/S success as a set of relevant criteria comprised of both importance and performance components, and by measuring success from both user and I/S perspectives, we have developed a method which allows us to identify critical gaps in importance and performance ratings and, therefore, to determine the top priorities for I/S action. These top priorities, and the resulting improvement efforts, provide the guidance and assurance that we maximize the overall contribution to I/S success by expending incremental attention and resources on those areas which need it most.

We can realistically expect to maximize our present contribution to overall I/S success by reducing the largest importance-performance gaps. We must also expect that improved success will contribute to the need to understand and address new priorities reflecting new importance-performance gaps. However, by periodically assessing I/S success and determining new top priorities we can assure that we remain sensitive to the changing requirements in the complex, fast-paced I/S environment. Moreover, periodic measurement of I/S success will provide follow-up evaluation of previously implemented improvement efforts. The User Needs Survey definition of I/S success and priorities can be used in a management planning process to yield a strategic plan for goal-setting and resource allocation which insures the maximum contribution to overall I/S success.

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